

Validation measurements for remote sensing based agricultural monitoring: Status update for the German JECAM site DEMMIN / TERENO-NE

D. Spengler¹; N. Ahmadian²; E. Borg³; K. Harfenmeister¹; C. Hohmann¹; C. Hüttich²; S. Itzerott¹; H. Maass³; K.-D. Missling³; C. Schmullius⁴; S. Truckenbrodt^{3,4} & C. Conrad^{2,5}

Affiliations: 1 Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ; 2 Julius-Maximilians-Universität Würzburg; 3 Deutsches Zentrum für Luft –und Raumfahrt e.V. (DLR); 4 Friedrich-Schiller-Universität Jena; 5 Martin-Luther-Universität Halle-Wittenberg

Objectives

Remote sensing (RS) data are becoming increasingly relevant in environmental monitoring to support decision-making processes. However, an essential requirement for method development is a suitable in-situ database. The DEMMIN test field aims at this property and combines satellite image data, in-situ data with information from farmers and foresters to improve the acquisition of valuable knowledge with three objectives:

- 1) Method Development
- 2) RS Data Validation
- 3) Knowledge Transfer

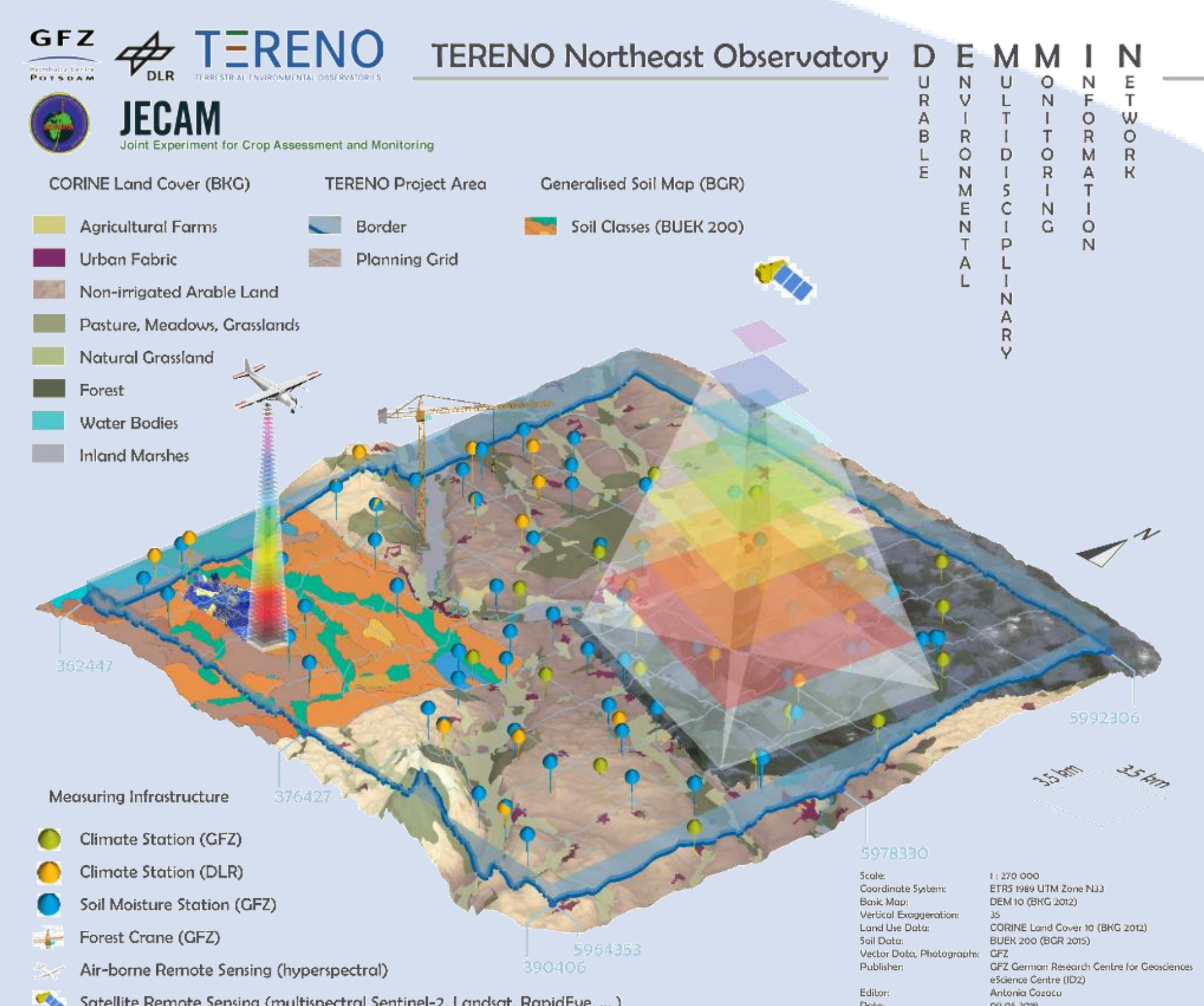


The test site is an intensively used agricultural ecosystem. In the north the topography with an altitude difference 0 – 84.5 m above sea level is rather flat and in the south hilly to undulating. Cause of significant differences in parent substrate material and relief a high spatial variability of soil types are developed.

The location of the gauging station is linked to these different conditions and its according landuse.

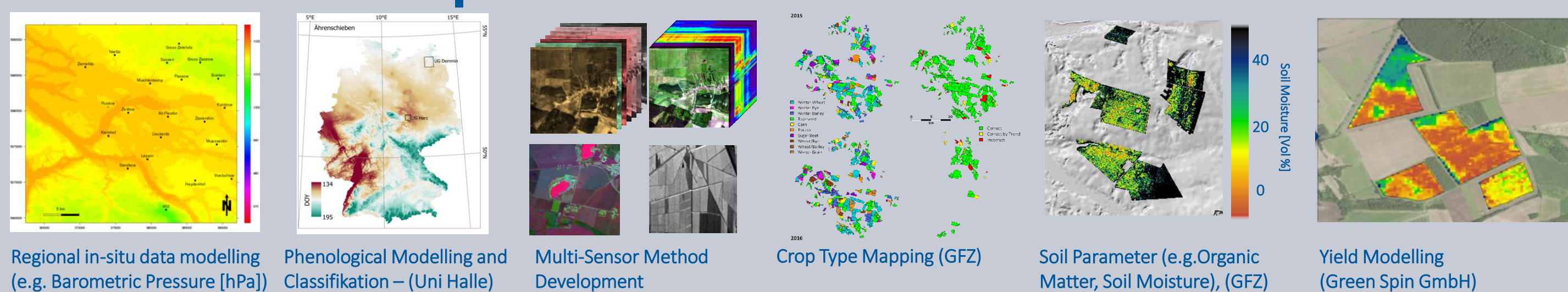


DEMMIN



DEMMIN 2.0 Concept

1) Method Development

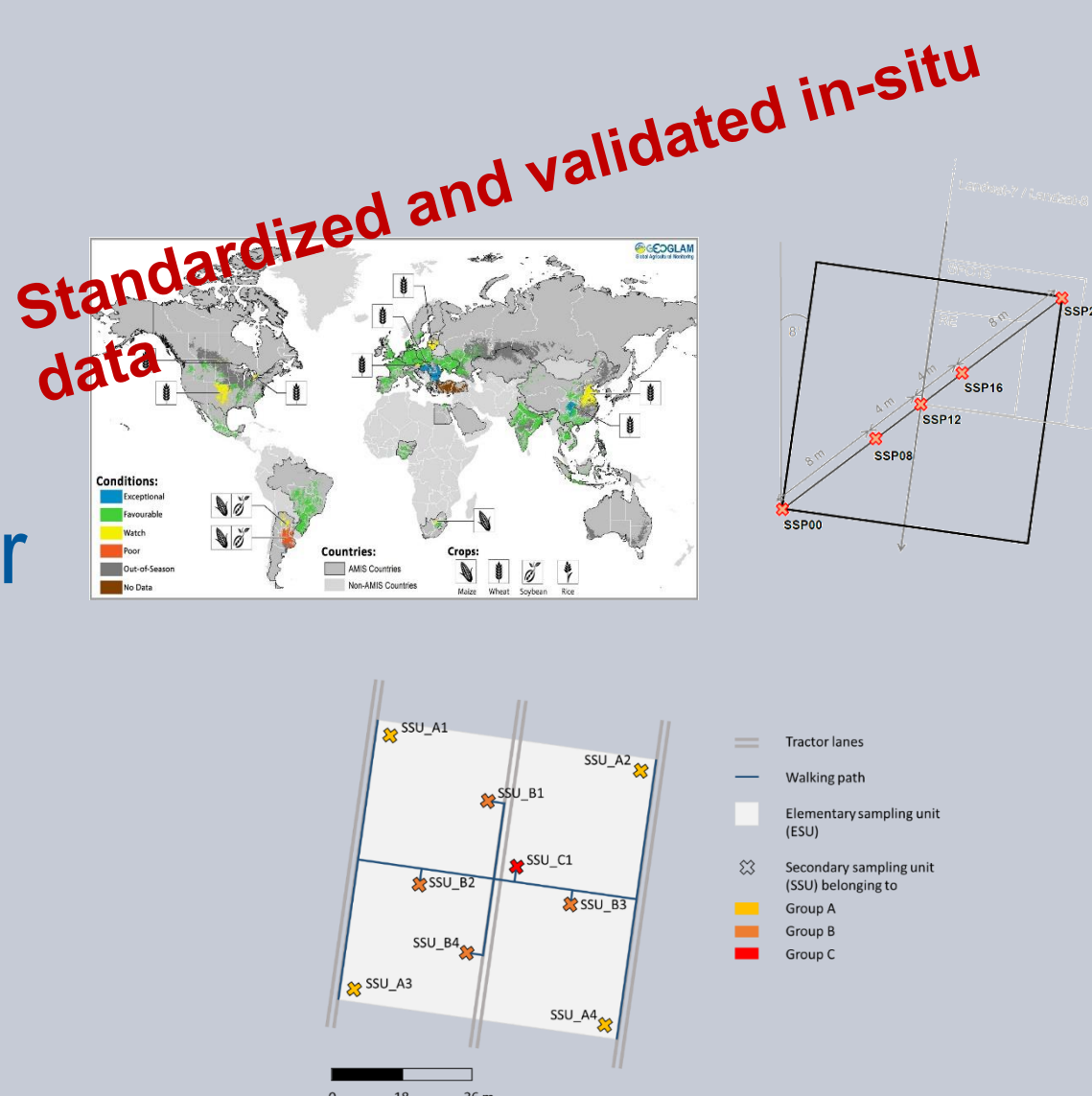


2) RS Data Validation

- Method validation (e.g. JECAM crop type mapping, SAR inter-comparison experiment)
- HYPERNETS project (spectrometer for surface reflectance validation)

3) Knowledge Transfer

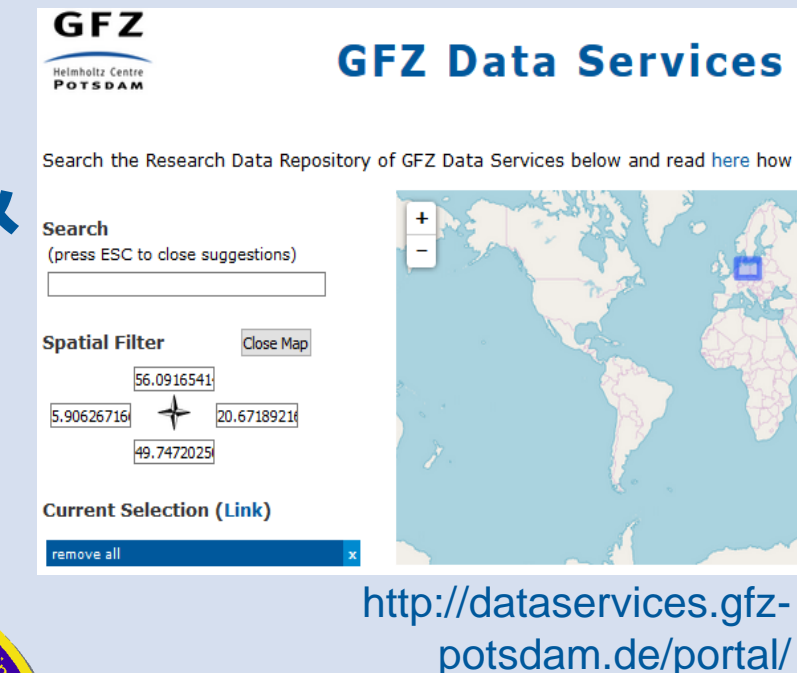
- Field campaigns for universities
- Standardized acquisition of field data



Cooperation / Network / Data

Data

- Secure data transfer
- QA/QC of data
- Value-added information
- Open data access (via DOI)



Cooperation / Networking

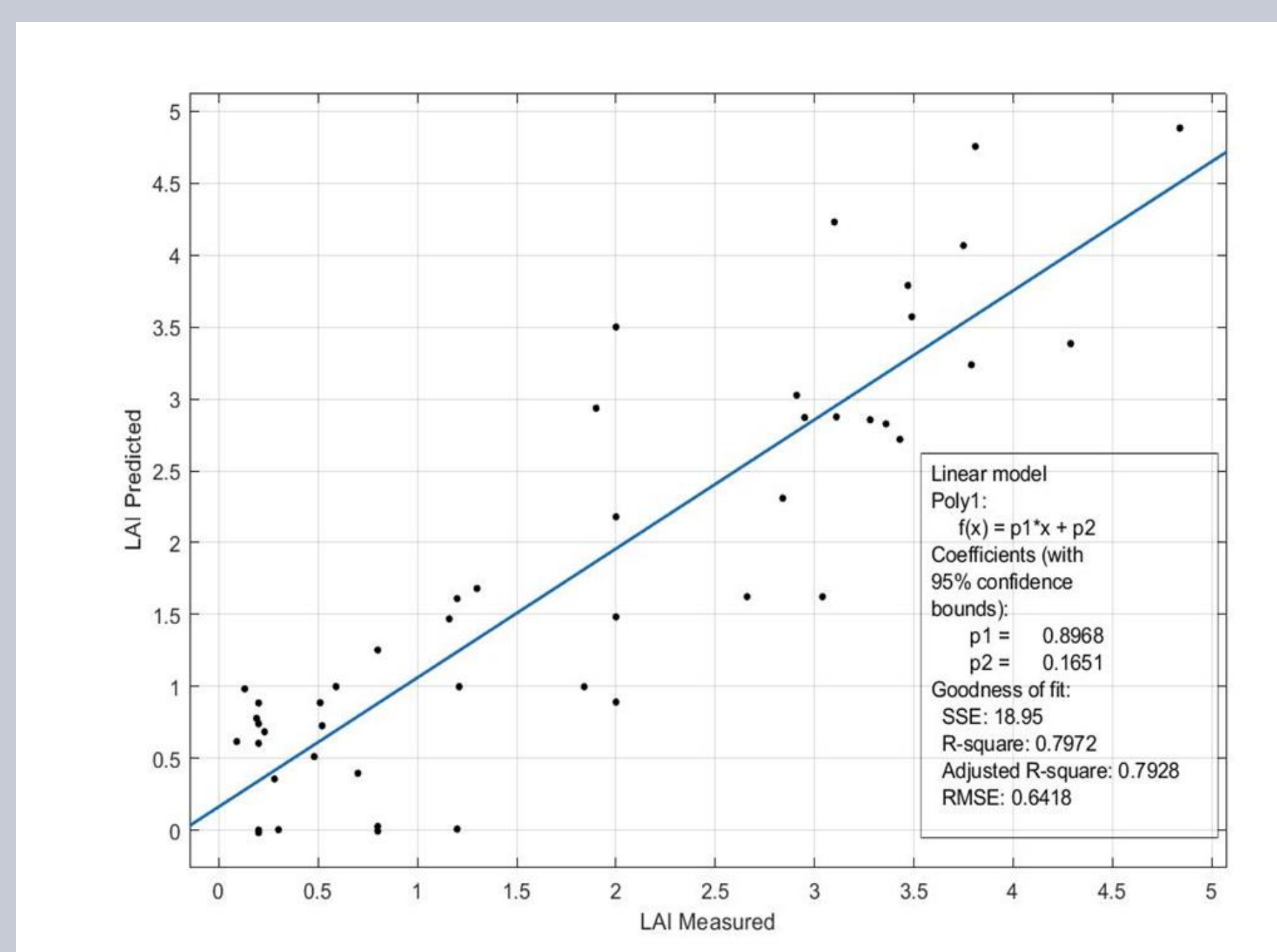
- Cooperation with national and international universities, research institutes, companies and initiatives:
- Official German site of the GLAM / JECAM network
- National & international projects



Selected Scientific Projects

Determination of Crop Parameter

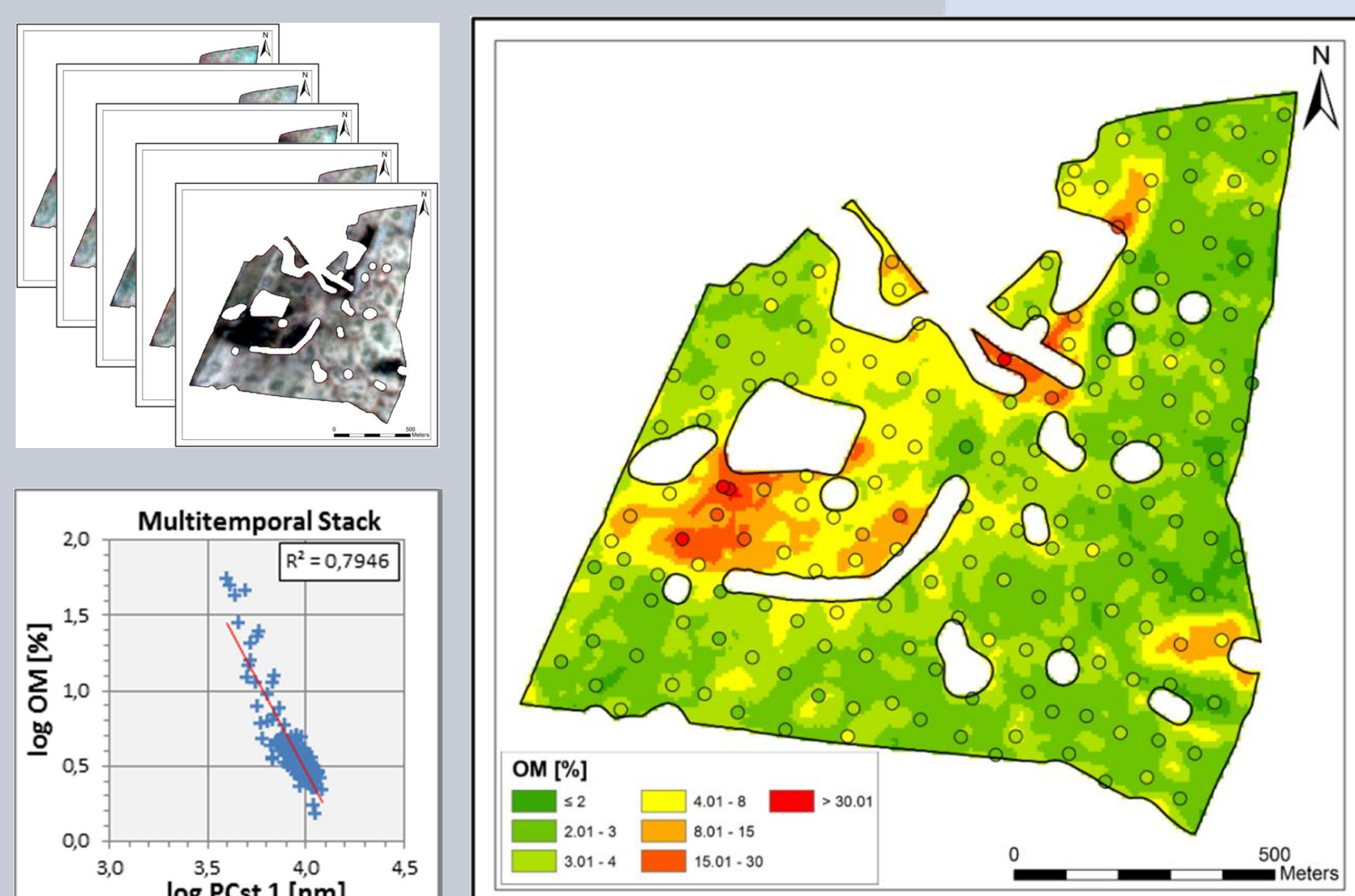
- Determination of Leaf Area Index based on Water Cloud Models (VV/VH)
- Sentinel-1 data of 2015



Dr. Nima Ahmadian

Determination of Soil Parameter

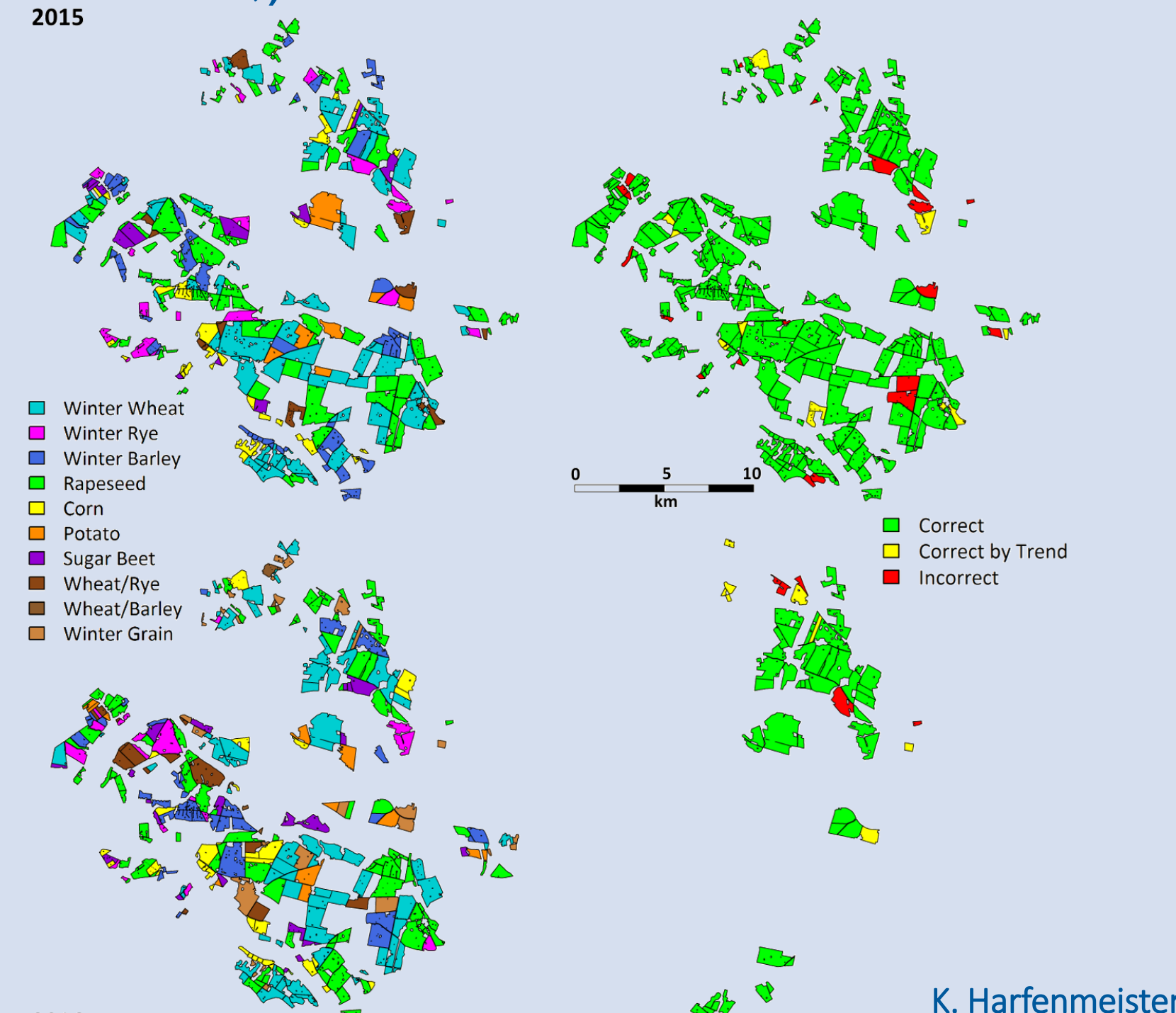
- Determination of surface soil organic matter content
- Multitemporal multispectral data (e.g. RapidEye, Landsat, Sentinel-2,)



Dr. G. Blasch

Determination of Crop Parameter

- Progressive crop type classification
- Based on multitemporal multispectral data (e.g. RapidEye, Landsat, Sentinel-2,)



K. Harfenmeister